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EXAMINER

CLOVE, THELMA S

ART UNIT PAPER NUMBER

2879

DATE MAILED: 06 19 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/808,317

Applicant(s)

UEDA ET AL.

Examiner

Thelma S Clove

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5 and 7-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7-13 and 15-22 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s): _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 5, 8, and 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakayama et al. (JP 405343183).
3. Regarding claims 1-2, and 17-19, Nakayama teaches a light emitting device comprising an emission layer an anode and a cathode, wherein the anode comprises a layer of ITO and a 20 nm layer of titanium oxide (in the abstract).
4. Nakayama does not specify the transmittance of the anode, or the wavelength range that for the transmittance. However, Nakayama does teach the structure of the double layer anode, as taught by the Applicant in the specification, wherein the first layer comprises ITO and the second layer comprises a 20 nm layer of titanium oxide.
5. Although Nakayama does not specifically disclose the transmittance for visible light (according to claims 1 and 17) in the wavelength range 380-780 nm (according to claims 2 and 18), this feature is seen to be an inherent characteristic of the anode of Nakayama, since it has the same structure as the anode taught by the Applicant.
6. Regarding claims 3 and 21, Nakayama teaches the anode having a double layer, wherein the first layer is ITO and the second layer is titanium oxide (in the abstract).

7. Regarding claims 5 and 20, Nakayama teaches the second layer as an oxide of titanium (in the abstract).

8. Regarding claim 8, Nakayama teaches the device comprising a transparent substrate, a built up body comprising the anode, an organic emissive layer and a cathode (in figure 4 and paragraph 8 and 12 of the English abstract).

9. Regarding claim 15, Nakayama teaches the thickness of the second layer (titanium oxide) as 20 nm (in the abstract).

10. Regarding claim 16, Nakayama teaches a light-emitting device comprising an anode with a layer of ITO and a thin layer of titanium oxide. Since this anode comprises the same materials as taught by the applicant, the luminance and contrast would increase as the thickness of the second layer was decreased within the range of 15-80 nm. This limitation is directed to a characteristic of the material and not of the structure of the device. Since Nakayama teaches the same materials, ITO and titanium oxide, used in the anode as those claimed by the Applicant, and within the same range (20 nm), the second layer would have this characteristic.

11. Claims 1-3, 5, 7, 12, 13, and 17-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Pichler et al. (WO 9810473).

12. Regarding claims 1-3, 5, and 17-21, Pichler teaches a light emitting device comprising a two layer anode, wherein the first layer is ITO and the second layer is a thin layer of Ni, Pd, Pt, or Re (on page 12 third paragraph), wherein the thickness of the

second layer can be chosen according to the need for semi-transparency (on page 13 first paragraph).

13. Although Pichler does not specifically disclose the transmittance for visible light (according to claims 1 and 17) in the wavelength range 380-780 nm (according to claims 2 and 18), this feature is seen to be an inherent characteristic of the anode of Pichler, since it has the same structure (a double layer anode of ITO with a thin layer of Ni, Pd, Pt, or Re) as the anode taught by the Applicant.

14. Regarding claim 7, Pichler teaches the anode layer having a work function greater than 4.7 eV (on page 12 third paragraph).

15. Regarding claim 12, Pichler teaches the device used in a display (on page 1, second paragraph).

16. Regarding claims 13 and 22, Pichler teaches the second layer being an alloy or doped semi-conducting compound of Ni, Pd, Pt, Re, along with Ag and Au, wherein the work function is greater than 4.7 eV (on page 12, third paragraph).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al. (JP 405343183) as applied to claims 1 and 8 above, and further in view of Sony (JP 10335066).

19. Regarding claims 9-11, Nakayama teaches a light-emitting device according to claims 1 and 8, as applied above, wherein the device comprises an anode, a hole-transport layer, a hole-injecting layer, a luminescent layer, an electron-injecting layer, and a cathode (in paragraphs 4, 8, and 12).

20. Nakayama does not teach an electron-transporting layer.

21. Sony teaches a light emitting device comprising an anode, a hole-transporting layer, a hole-injecting layer, a luminescent layer, an electron-transporting layer and electron-injecting layer, and a cathode (in the abstract).

22. Sony teaches that having a hole-transporting layer, a hole-injecting layer, a luminescent layer, an electron-transporting layer and electron-injecting layer gives the device improved stability in light emission and durability of operation (in the abstract).

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the hole-transporting layer, hole-injecting layer, electron-transporting layer and electron-injecting layer design of Sony in the device of Nakayama since it improves the stability of light emission as taught by Sony.

24. Regarding claim 10, Sony teaches the hole injection layer between the hole transport layer (in the abstract and figure 2).

25. Regarding claim 11, Sony teaches the emission layer between the hole transport and the electron transport layer (in the abstract and figure 2).

Allowable Subject Matter

26. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

27. The following is a statement of reasons for the indication of allowable subject matter: Regarding claim 14, the prior art of record neither shows nor suggests a two layer anode according to claim 1, wherein the anode is doped with $RxNiO$, $RxWO_3$, $TiNb_xO_y$, where R is (H, Li, Na, K, Rb, Cs, Cu, Ag, or Au). The closest art is Pichler et al. (WO 9810473), as applied to claim 13 above, which teaches the anode doped with silver or gold. However, Pichler does not teach the silver or gold in the composition of a nickel of tungsten oxide.

28. The Applicant teaches that by using a dopant comprising at least one of $RxNiO$, $RxWO_3$, $TiNb_xO_y$, where R is (H, Li, Na, K, Rb, Cs, Cu, Ag, or Au), the physical and chemical characteristics of the anode are improved.

Conclusion

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Igarashi (US 6210817).

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thelma S Clove whose telephone number is (703) 308-6548. The examiner can normally be reached on Monday-Friday from 8 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7382 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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TSC

June 11, 2002

